

REMARKS

The Final Rejection mailed January 5, 2010, and the prior art relied upon therein have been carefully studied. Including the withdrawn claims, the claims in the application are now claims 1-20, 24-35 and 38-41, with claims 36 and 37 having been cancelled above. The claims in the present application recite patentable subject matter which warrants their allowance. Favorable reconsideration, entry of the amendments presented above, and early formal allowance are all respectfully requested.

The typographic error at page 8, line 25, helpfully pointed out by the Examiner, is corrected above.

Claim 24 has been objected to as containing two periods at its end. It has been appropriately corrected above.

Claims 36 and 37 have been held to be substantial duplicates of claims 29 and 30. Accordingly, claims 36 and 37 have now been deleted without prejudice to Applicant's rights to pursue such claims at a later time, if it becomes necessary or desirable to do so. Such deletion is not to be taken as agreement by Applicant of the objection at paragraph 7 on page 3 of the Final Action.

Claim 1 has been rejected under 35 USC §102 as anticipated by Taylor et al U.S. Patent No. 4,067,056 (Taylor). This rejection is respectfully traversed.

Claim 1 calls for a pyroelectric compound which is an inorganic, quasi-amorphous oxide compound having piezoelectric

properties. Such subject matter is not enabled by Taylor, and therefore Taylor does not anticipate claim 1.

Taylor discloses an apparatus and method for continuously poling (applying mechanical strain to) an organic polymer film, namely a polyvinylidene fluoride or polyvinyl fluoride pyroelectric and/or piezoelectric film.

Applicant does not dispute that Taylor does mention (only once) at col. 4, line 37, that the layer 12, preferably formed from an elastomeric material such as silicone rubber, may instead be a ceramic material, but the layer 12 is not the material being poled; instead, the layer 12 is the surface material of the roller 11. Taylor clearly does not disclose poling the layer 11, and would not anticipate claim 1 even if the layer 12 were quasi-amorphous ceramic, or even any ceramic.

Moreover, even if Taylor disclosed that the material being poled was ceramic (not disclosed by Taylor), claim 1 could still not be anticipated because **Taylor provides no enabling disclosure as to how this might be done.** Indeed, Taylor does not disclose how to start from amorphous ceramics to create piezoelectric/electrostrictive properties while preventing crystallization of the ceramics.

The poling of (applying mechanical strain to) an inorganic material to provide pyroelectric and piezoelectric properties is not a trivial issue due to the lack of spatial periodicity inherent to ionic crystals. As noted above, Taylor actually deals with organic materials, and contains no disclosure or teaching whatsoever relating to an **amorphous ceramic material** in which a mechanical strain is controlled so as to prevent crystallization of an inorganic compound. Thus,

there is no enabling disclosure in Taylor describing how a ceramic material can be used in a pyroelectric compound.

The law is clear that for a disclosure to be anticipatory, the person skilled in the art must be enabled to practice the feature disclosed in the reference. As there is nothing in the prior art, insofar as is known, which would have permitted the person skilled in the art to extrapolate the method of Taylor to a ceramic material in such a way as to achieve the subject matter of claim 1, it follows that Taylor does not anticipate claim 1.

Withdrawal of the rejection is in order and is respectfully requested.

Claims 1, 4-20, 24-37 and 41 have been rejected as obvious under 35 USC §103 from previously applied Takeuchi in view of newly applied Foreman U.S. Patent No. 5,483,842 or Hagood et al USP 6,048,622 (Hagood). These rejections are respectfully traversed.

Takeuchi was addressed in the preceding Reply, where it was pointed out that Takeuchi does not provide an enabling disclosure, and does not inherently provide or lead to the claimed invention. The remarks from the preceding Reply concerning Takeuchi are respectfully repeated by reference.

Newly cited and applied Foreman and Hagood, applied alternatively, do not make up for the deficiencies of Takeuchi. Consequently, even if it were obvious to somehow modify Takeuchi in view of either Foreman or Hagood, the so modified Takeuchi would still not correspond to the claimed subject matter. In this regard, both Foreman and Hagood relate to the conventional application of an electric field on a piezoelectric material,

and provide no teaching whatsoever regarding a quasi-amorphous ceramic compound, and certainly do not disclose or teach how to obtain a quasi-amorphous oxide compound having piezoelectric properties, as claimed. In other words, the teachings of Foreman and Hagood with respect to the application of an electrical field on a piezoelectric material do not make obvious what a person of ordinary skill in the art is to do with respect to Takeuchi in order to reach the subject matter of Applicant's claims.

Applicant also believes and respectfully submits that the proposed combinations would not have been obvious, at least to the extent of the person of ordinary skill in the art trying to put together the subject matter of Takeuchi with the quite different subject matter of either Foreman or Hagood, or how this might be done. The prior art provides no reason why one would even want to try to change what Takeuchi teaches in view of anything disclosed by Foreman or Hagood.

Accordingly, for at least the two reasons given above, namely (1) the non-obviousness of the combination and (2) the fact that the combination (even if obviously combinable) would not reach the claimed subject matter, there is no valid *prima facie* obviousness. Added to this is that the prior art provides no reasonable expectation of Applicant's effects.

The present invention provides a surprising effect in which an amorphous compound, while being **inorganic**, shows clear pyroelectric and piezoelectric properties despite the lack of spatial periodicity inherent to ionic crystals. Usually piezoelectric effect is found only in crystals which have no center of symmetry. Moreover, in the present invention a

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mechanical strain is applied to the **amorphous compound**, such that the mechanical strain does not promote the formation of crystallites within the quasi-amorphous compound. All the cited references are silent about such properties.

Withdrawal of both rejections under §103 is in order and is respectfully requested.

The prior art documents of record and not relied upon by the PTO have been noted, along with the implication that such documents are deemed by the PTO to be insufficiently material to warrant their application against any of Applicant's claims.

Applicant believes that all issues raised in the Final Action have been addressed above in a manner that should lead to patentability of the present application. Favorable reconsideration, entry of the amendments above, and early formal allowance are respectfully requested.

If the Examiner has any questions or suggestions, the Examiner is invited to contact the undersigned at (202) 628-5197.

Respectfully submitted,

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